



Revisiting the Power Triangle: A Note on Spillover Effects of Positive Power Externalities

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Abstract

The environment is not an entity external to socioeconomic activities; but it directly interacts with and suffers from their effects. Sustainable development policies are a hard task for every country and power externalities may arise at any time. The spillover effects of power externalities additionally show us society's responsibility towards economic choices of consumption and production. The spillover effects can clarify the channels through which the power externalities affect the environment and society as well. The spillover effects of positive power externalities can introduce the economics of a new paradigm that can be seen as strategic tracks to ensure food safety and human security in terms of sustainable economic development.

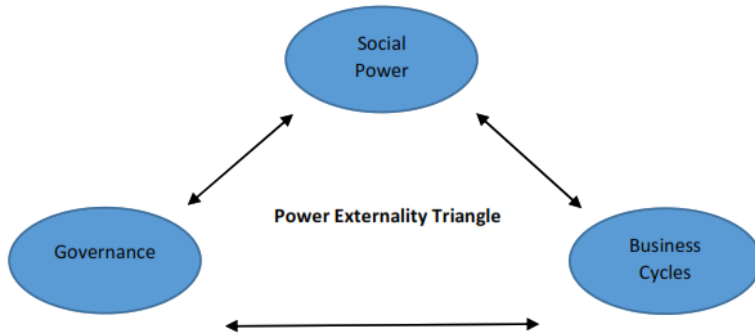
1. Introduction

When we consider social power analysis and governance tools in terms of welfare economic theory, an interconnection that has arisen is what I have described as power externality. The aim of this article is to revisit the concept of power externality, considering the spillover effects of positive power externalities as a way to channel both economic development and environmental policies.

Additionally, this analytical structure can offer ways of looking at environmental policies as tools that empower society to take actions towards production and consumption decisions based on the concept of economic efficiency. Also, these can be seen as strategic tracks to ensure food safety and human security in terms of sustainable economic development. As I previously introduced, power externality can be understood as a concept that suggests a way to look for a more integrated approach in sustainable development that deals with the interconnections among social power relations, economics and governance tools (Pinheiro 2019).

As it was previously pointed out, we can define power externality as a situation where the interconnected social power relations, jointly with the political-economic business cycles and governance agendas, affect a third part, in this case the environment, not directly related to this matter. The power externality concept considers the interconnections between economics and the entire system of social power relations and governance structures, as the power triangle suggests:

Figure 1: The Power Triangle



Source: developed by the author.

This analytical structure is based on interdisciplinary theoretical foundations in order to link the dimensions of public policies considering social power relations, governance structures, business cycles and the potential spillover effects of public policies on society. The spillover concept takes into account the effects of all the positive power externalities—beneficial spillovers to a third party or parties. The beneficial spillover effects are related to the social and environmental benefits of a new way of consumption or production. Additionally, they could be linked to the benefits generated by the public and/or the private sectors that develop or spread actions that produce positive power externalities.

The article is organized as follows: after this introduction, in Section 2, the concept of power externality is revisited. The spillover effects of positive power externalities are shown in a schematical structure in Section 3. It illustrates how different aspects of social power relations interact together with governance and economic/business cycles to spillover positive power externalities. Section 4 summarizes the main conclusions, as well as possible horizons for future research and potential empirical approaches.

2. Power Externality

In a previous article (Pinheiro 2019), I argued that considering the interconnections among the economic business cycles, the governance structures and the different levels of social power relations, the controversial actions concerning the sustainable development and environmental change agendas in Brazil was a result of a negative power externality. In this sense, I defined negative power externality as a situation where, although the government and society are conscientious about the challenges and risks of exploiting the natural resources because of the flexibility and interchangeability between power relations, jointly with the political-economic business cycles and governance agendas, the best choices in terms of climate and sustainable development policies are not fulfilled as expected and, as a result,

the environment is harmed. Likewise, in economic theory, we can have a positive power externality too.

I defined a positive power externality as a situation where, although the government and society are conscientious about the challenges and risks of exploiting the natural resources, because of the flexibility and interchangeability between power relations, jointly with the political-economic business cycles and governance agendas, the best choices in terms of climate and sustainable development policies are more likely to be achieved and the environment is benefited. A positive power externality is a good outcome for the environment and society as a whole since it spreads improvements in general.

There are two traditional governance approaches to handle the government and society tradeoffs between environmental and sustainable development policies: the top-down approach and the bottom-up approach. The top-down approach settles assurance problems through legally binding obligations. On the other hand, the bottom-up approach has confidence in transparent and voluntary commitments that are subject to regular reviews. A mixed approach is possible too. Following this way, countries accept a bottom-up structure in terms of conventional frameworks and then adopt top-down protocols within a convention that bind them to accomplish obligations.

In a strictly economic view, these governance approaches could be seen as a way to deal with the contentiousness between what global society needs in terms of consumption and production and the scarcity of natural resources. A world of free market relations and spontaneous environmental and climate consensus, in terms of political thought and economic sustainable use of natural resources can be seen as the first-best outcome, in analogy with the Pareto efficiency criterion in the welfare theory of economics. The earliest works that support the efficiency criterion argument can be found in Pareto and Lancaster (1906) and Lipsey (1956). However, this scenario is not achievable. Therefore, the governance challenge faced by governments and civil society relies on how to perform the governance approaches since the countries have different levels of development and socio-economic needs that frequently put in check the achievement of a climate change consensus.

For instance, the second-best situation is more likely to be reached in the real world and the governance structures play a crucial role in terms of the second-best sustainable and environmental policies since the first-best option is never achievable. This means that the ideal or first-best solution of a full environmental consensus in terms of sustainable use of the natural resources that would generate global efficiency is not feasible. In this situation, it is not clear if only one or a few environmentally committed countries will be able to increase the efficiency of sustainable policies as a whole. Thus, the countries may often have to negotiate in terms of the governance structures that are more achievable, as we argued before.

The outcome of the countries' negotiations is the second-best solution and we consider that it denotes a result of exercising institutional power. Institutional power as a way of reaching a second-best solution indicates an exercise of power through the authority of formal social power systems and institutions. The power externality triangle we are proposing shows us that beyond the business cycles' concept, there are two other concepts embracing governance and social power. These three concepts put together demonstrate that sustainable

development and climate change policies need critical thought and effective actions on the part of civil society, business actors, institutions and governments.

Both types of power externality end in allocative inefficiency. This allocative inefficiency could be interpreted as follows: due to flexibility and interchangeability between power relations, business cycles and governance agendas, the first best solution, in terms of free competitive decision-making by the economic agents (or actors) in countries, or the first-best choices, in terms of spontaneous and consensual sustainable development policies, are not performed as expected. In this sense, sustainable development policies and climate change actions are a result of institutional power and other forms of social power negotiations that produce the second-best solution. In this context, the second-best solution in terms of the different social power interactions in the power triangle gives us a mechanism to overcome power externalities by means of economic and public policies and public administration.

2.1. Overcoming Power Externalities

Figure 2 shows us an interpretative scheme of the second-best solution among the three pillars of the power externality triangle. The second-best solutions come from policies that can overcome power externalities. The first one links social power relations and economics (business cycles). The second one considers the linkage between economics and governance. Finally, the last linkage covers governance and social power levels. These linkages could be exercised through interconnections along the integrated system of the power triangle.

When we link social power with the business cycle's axis, a way to overcome power externalities that may arise considers the government's power in planning, organizing, coordinating and managing the economic and social systems. Public policy is a process of selecting strategies and making choices. In this sense, the public policy ways of overcoming externality may include some steps like getting an agenda, policy formulation, policy adoption, policy implementation, and so on.

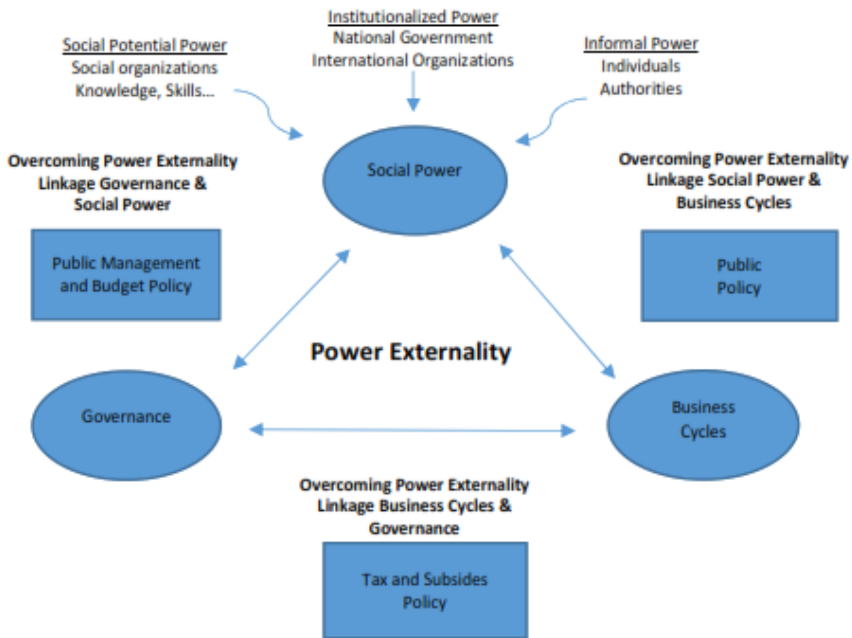
A way of overcoming power externalities that may arise from the linkage between business cycles and governance should contemplate an appropriate economic policy in the exercise of institutionalized power by governments, since the economic agents by themselves do not consider the entire effects of their activities over nature or society as a whole. As Pigou (1920) noted in his book—*The Economics of Welfare*—“private businesses pursued their own private interests and were not concerned with external costs to others in society” since they have no incentives to internalize the full social costs of their actions. This is an early exposition of the externality concept in economics.

The Pigouvian approach considers taxes and subsidies as ways of overcoming externalities that may arise from the market economy. In the same way, the tax approach can be used in a corrective manner in order to diminish the consequences of a negative power externality. Alternatively, subsidies stimulate positive power externalities. A more recent approach to Pigouvian taxes can be found in Broadway and Tremblay (2008).

The linkage between governance and social power may consider elements of the new governance literature that address the role of markets, governments, networks and non-state

actors. For an appropriate discussion, see Lobel (2012). This approach meets the perspective of exercising the different levels of social power, as I described in the social power axis in figure 2. The ways of overcoming the externalities that may arise should contemplate appropriate public management and budget policies.

Figure 2. Power Externality Triangle: Overcoming Power Externalities



Source: developed by the author.

3. Spillover Effects of Positive Power Externalities

Positive power externalities generated by environmental policies, like stimulating renewable clean energy, emphasize a way to demonstrate the potential spillover beneficial effects of the multiple social actions and public policies chosen by society. Broadly speaking, the spillover effect refers to the impact that seemingly unrelated events can have on societies and the environment. There are positive and negative spillover effects. Although this concept is most commonly applied to the negative impact that a domestic event has on other countries, such as an earthquake, stock market crisis, or another macro event, positive spillover events may occur and should be stimulated. Positive spillover effects occur when changes in one behavior influence changes in subsequent practices in an efficient way.

Spillover effects are a type of network effect that can increase if there is leadership and incentive. Therefore, if we consider the spillover effects of positive power externalities

generated by human activities and/or appropriated public policies by governments, there will be a vast field of effective networking actions that can be implemented by society.

According to Nielsen, Bergquist and Schultz (2017, p. 574), “*when implementing environmental education and interventions to promote one pro-environmental behavior, it is seldom asked if and how non-target pro-environmental behaviors are affected. The spillover effect proposes that engaging in one behavior affects the probability of engaging or disengaging in a second behavior. Therefore, the positive spillover effect predicts that interventions targeting one specific behavioral have the capacity to promote non-targeted and/or future pro-environmental behaviors*”. Therefore, social actions and government policies can not only stimulate positive power externalities but also the pro-environmental behavioral aspects of them.

In the same way, the International Renewable Energy Agency (IRENA) stresses on its webpage that “*Latin America hosts some of the most dynamic renewable energy markets in the world, with more than a quarter of primary energy coming from renewables, twice the global average. Power sectors in the region are characterised by a high dependence on hydropower, and exploiting the complementarity between hydropower and variable renewable energy sources is a key leveraging factor for all renewables in Latin America.* (IRENA webpage, September 2021)

“*Countries are beginning to address diversification efforts in electricity systems and are working to create more enabling policy and regulatory environments. In this context, recent auctions in Argentina, Brazil, Mexico, Chile, and Peru have helped to accelerate the deployment of thousands of megawatts of wind and solar energy in the region*”.

“*Total investment in power generation reached almost USD 120 billion between 2010 and 2015, including USD 38 billion for large-scale hydropower. Costs for renewable energy technologies have fallen to the extent that solar and onshore wind power no longer need financial support to compete with conventional power generation in a growing number of Latin American countries*” (IRENA Webpage: irena.org).

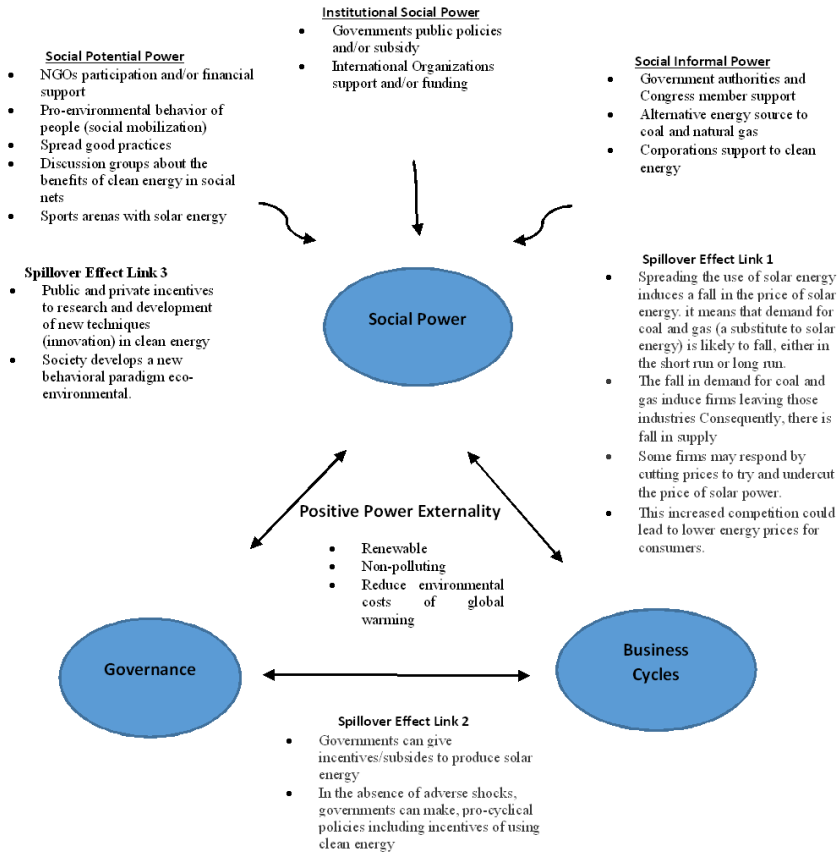
We can see that these very prominent international agencies address the relevance of investment in pro-environmental sources of energy, like renewable energy, as a way of optimizing energy generation. The growing use of renewable energy generates positive spillover effects of power externalities. Even in the context of adverse shocks and economic constraints, like the COVID-19 pandemic and the strong lobbying about fossil sources of energy, there are many ways to generate positive spillover effects and power externalities that come from working with renewable sources of energy.

According to Alvarez-Pereira (2019, p. 7), “for many, the transformation of economic processes cannot happen without a shift in our behaviour as consumers. This is one of many reasons to address Inner Transformation as another perspective on systemic change. It is a call to individuals to move from awareness and the anxiety it brings towards higher levels of consciousness about our relationships with others and with nature as a whole”.

Considering this argument, I add that the present need for reviewing the economic development tools and the ways they interact with the society makes it is clear the importance

of building new sustainable matrices of production and consumption is necessary. It definitely shows that renewable energy sources are the future of economic activities. These ways can be stimulated by positive spillover effects of power externalities. Positive power externalities can come from an entire net of social power actors, institutions and economic agents with a social power leadership structure, as we can see from figure 3.

Figure 3. Spillover Effects of Positive Power Externalities (solar energy scenario)



Source: developed by the author.

In the long run, society will see the net benefits of clean energy by transforming its traditional ways of production and consumption into new ones. Besides future positive spillover effects, it could take a considerable time for this switch to occur. Many countries may be reluctant to invest in solar energy plants when they are still more expensive. Besides,

they may be unwilling to invest money in developing new power stations, and out of habit, they may continue to use fossil fuels. Also, it will depend on how governments respond.

“The environment is not an entity external to socioeconomic activities; it directly suffers from their effects.”

The falling price of solar energy suggests there may soon be a market incentive to use solar energy rather than fossil fuels. Nevertheless, that has not quite happened yet. Given the positive externalities of solar power, there is a case for the government to subsidize solar energy to encourage its take-up rate. This potential positive spillover impact would improve social efficiency because it would speed up the adoption of solar energy and reduce the costs of burning fossil fuels.

There will be a negative impact on other industries. There may be a greater incentive to develop electric-powered cars or electric trains, which can be powered by solar energy. In the long run, this would reduce the demand for oil and natural gas. These positive spillover effects will change the paradigms of traditional ways of consumption and production. The social power relations will be affected, and the governments will be required to respond. The economics of a new paradigm will face a rupture with the old ones. Leadership to meet the challenges of the century will demand a precise observation of economic/business chains and the spillover effects related to them.

4. Final Remarks

It is worth highlighting that the aim of this note is not to develop an entire analytical structure but just to delineate a starting point for a more integrated system of thinking considering the dynamic interconnections among economics, governance and social power relations and the challenges in terms of sustainable development policies that policymakers are facing nowadays. In this sense, this note will contemplate just an introductory proposition concerning some theoretical topics as ways to overcome power externalities through spillover effects of positive power externalities.

The concept of power externality comprises social power relations as the main vortex of a sustainable development puzzle that contemplates the economic market system (the business cycles) and governance aspects. It should be noted that in economic theory as well, power externality refers to a free market failure. Accordingly, it is necessary to intervene in order to overcome this failure. This intervention can be extended to all economic agents and levels of government that may exercise power at a national level or at a global level by international organizations when we consider sustainable development policies.

Driving sustainable development policies is a hard task for every society and power externalities may arise at any time. It must be stressed that power externality is not a permanent situation since it could oscillate according to the multiple elements of the dynamic power externality triangle. In this sense, whenever a part of the triangle works in a bad sense

in terms of economic sustainability and environmental system as a whole, the power relations could work jointly with the public policies and the governance structures in order to reach an integrated reorientation of the power externality triangle. In the case of positive power externality, the power triangle enables policymakers and economic agents to identify policies that may stimulate the best practices and the social and economic tools that improve them. (Pinheiro, 2019).

In this sense, power externalities show us the relevance of societies' choices, channeling the positive spillover effects of public policies and social actions. The decision-making process of appropriate public policies stimulating positive power externalities should take into account that the power externality triangle elements are continually interacting and affecting each other. This notion aims to lay the foundations for the analysis of multiple scenarios and strategies in order to identify and stimulate positive spillover effects of power externalities. The environment is not an entity external to socioeconomic activities; it directly suffers from their effects. The principle of spillover power externalities considers the effects of spreading positive or negative power externalities over the planet, which includes the environment as well.

In terms of future research, positive power externalities' origins could be empirically explored. Future research agendas may consider developing a detailed power externality matrix regarding public policies and social actions that can better generate positive spillover effects. The positive spillover effects may change the paradigms of traditional ways of consumption and production. The environment must be seen as an entity in society's decision-making system. The power externality spillover effects can clarify the ways in which social power relations affect the environment and society. The governments will be claimed to better respond. The economics of a new paradigm will face a rupture with the old structures that disregard the interaction between the environment and society. In this sense, leadership to meet the challenges of the century will demand a precise observation of an entire chain of spillover effects of power externalities.

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Bibliography

1. Alvarez-Pereira, Carlos, "Emerging New Civilization Initiative (ENCI): Emergence from Emergency," *Cadmus* 4, no 1 (2019): 1.
2. Berta, Nathalie, "On the Definition of Externality as a Missing Market," *The European Journal of the History of Economic Thought* 24, no 2 (2017).
3. Biesbroek, Robbert, et al, "Europe Adapts to Climate Change: Comparing National Adaptation Strategies," *Global Environmental Change* 20, (2010): 440.
4. Broadway, Robin and Tremblay, Jean-François, "Pigouvian Taxation in a Ramsey World," *Asia-Pacific Journal of Accounting Economics* 15, no 2 (2008).
5. Davoudi, Simin, Crawford, Jenny and Mehmood, Abid, "*Planning for Climate Change: Strategies for Mitigation and Adaptation for Spatial Planners*," ed. Earthscan/James and James (London: 2009).
6. International Energy Agency, *Global Energy Review* (2021).
7. Jacobs, Garry, "Foundations of Economic Theory: Markets, Money, Social Power and Human Welfare," *Cadmus* 2, no 6 (2016): p. 20.

8. Jens, Marquardt, "Conceptualizing Power in Multi-level Climate Governance," *Journal of Cleaner Production* 154, (2017): 167.
9. Lancaster, Elvin; Lipsey and Richard G, "The General Theory of Second Best," *The Review of Economic Studies* 24, no 1 (1956): 11.
10. Lazarus, Richard J, "Super Wicked Problems and Climate Change: Restraining the Present to Liberate the Future," *Cornell Law Review* 94 (2008): 1153.
11. Lin, Steven A. Y. and Whitcomb, David K, "Externality Taxes and Subsidies in Theory and Measurement of Economic Externalities," ed. Academic Press (New York: 1976).
12. Lobel, Orly, "New Governance as Regulatory Governance," (ed. The Oxford Handbook of Governance 2012).
13. Nagan, Winston P, The Concept, Basis and Implications of Human-Centered Development, *Cadmus* 3, no 1 (2016): 27-35.
14. Nielssen, Andreas, Bergquist, Magnus and Schultz, Wesley P, "Spillover Effects in Environmental Behaviors, Across Time and Context: A Review and Research", *Environmental Education Research* 23, no 4 (2017): 573.
15. Pareto, Vilfredo, "Manual of Political Economy," ed. Macmillan (London 1906).
16. Pigou, Arthur C, "The Economics of Welfare 4th," ed. Macmillan (London 1932).
17. Pinheiro, Danielle Sandi, "Power and Climate Change Governance: Negative Power Externality and the Brazilian Commitment to the Paris Agreement," *Cadmus* 3, no 6 (2019): 191.
18. Repetto, Robert, "The Climate Crisis and the Adaptation Myth," *Yale School of Forestry and Environmental Studies, Working paper*, no 13 (2008).
19. Rittel, Horst W. J. and Webber, Melvin M, "Dilemmas in a General Theory of Planning," *Policy Sciences* 4, (1973): 155.